



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,129	07/16/2003	Yuriy Gmirya	67,008-070;S-5668	1958
74187	7590	11/13/2009	EXAMINER	
Carlson, Gaskey, & Olds, P.C./Sikorsky 400 West Maple Road, Suite 350 Birmingham, MI 48009				LE, DAVID D
ART UNIT		PAPER NUMBER		
3655				
MAIL DATE		DELIVERY MODE		
11/13/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

*Ex parte* YURIY GMIRYA

---

Appeal 2009-002750  
Application 10/621,129  
Technology Center 3600

---

Decided: November 12, 2009

---

Before WILLIAM F. PATE, III, JOHN C. KERINS, and  
FRED A. SILVERBERG, *Administrative Patent Judges*.

SILVERBERG, *Administrative Patent Judge*.

DECISION ON APPEAL

## STATEMENT OF THE CASE

Yuriy Gmirya (Appellant) seeks our review under 35 U.S.C. § 134 of the final rejection of claims 1, 3<sup>1</sup>-24, 26, 27 and 38-45, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

## SUMMARY OF DECISION

We AFFIRM.

## THE INVENTION

Appellant's claimed invention is directed to a split torque gearbox for an aircraft (Spec. 1: ¶ [1]).

Claim 1, reproduced below, is representative of the subject matter on appeal.

1. A split torque gearbox system comprising:
  - a first spur gear mounted for rotation about a first spur gear axis of rotation;
  - a second spur gear mounted for rotation about a second spur gear axis of rotation; and
  - a floating pinion gear driven by a radially unsupported pinion shaft, said floating pinion gear mounted for rotation about a floating pinion axis of rotation which provides a resilient characteristic, said floating pinion gear meshed with said first spur gear and said second spur gear, said floating

---

<sup>1</sup> The Status of Claims section of the Appeal Brief does not include claims 4-6 as being appealed (App. Br. 2). However, claims 4-6 are noted as being presently rejected under 35 U.S.C. § 103 (App. Br. 4, 8) and are presented in the Claims Appendix submitted with the Appeal Brief. Further, claims 4-6 are included in the Grounds of Rejection section of the Examiner's Answer (Ans. 3). Inasmuch as the Examiner appears to consider claims 4-6 as appealed, claims 4-6 will be considered in this appeal.

pinion gear axis of rotation displaceable to split a load between said first spur gear and said second spur gear, said floating pinion axis of rotation, said first spur gear axis of rotation, and said second spur gear axis of rotation located along a common line, said radially unsupported pinion shaft driven through a gear mesh generally transverse to the floating pinion axis of rotation such that said radially unsupported pinion shaft is displaceable off said common line to split said load between said first spur gear and said second spur gear.

### THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

White	US 4,489,625	Dec. 25, 1984
Kish	US 5,813,292	Sep. 29, 1998

The following rejections<sup>2,3</sup> by the Examiner are before us for review:

---

<sup>2</sup> The Final Rejection mailed February 6, 2007, included a rejection of claims 41-45 under 35 U.S.C. § 112 (§ 112 rejection). The Advisory Action mailed April 11, 2007, withdrew the § 112 rejection. In the Appeal Brief filed April 3, 2007, Appellant noted that the § 112 rejection had been withdrawn (App. Br. 2). In the Examiner's Answer mailed December 17, 2007, the Examiner noted that the Appeal Brief does not address the § 112 rejection (Ans. 3) and included the § 112 rejection in the section Grounds of Rejection (Ans. 4). In the Reply Brief filed February 1, 2008, Appellant noted again that the § 112 rejection had been withdrawn. As the § 112 rejection was withdrawn in the Advisory Action, the § 112 rejection will not be considered in this appeal.

<sup>3</sup> In any further prosecution on the application, Appellant should amend claim 8, line 8 (App. Br. 12) by adding a - - , - - (comma) after the word "characteristic" to more clearly set forth the invention,

1. Claims 1, 3, 4, 12, 16-24, 38, 41-44<sup>4</sup> are rejected under 35 U.S.C. § 102(b) as being anticipated by White.
2. Claims 5-11, 13-15, 26, 27, 39, 40 and 45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over White in view of Kish.

## ISSUES

The issues before us are: (1) whether the Examiner erred in finding that White describes a radially unsupported pinion shaft and a floating pinion gear mounted for rotation about a floating pinion axis of rotation, which provides a resilient characteristic as called for in independent claims 1, 8 and 12 (Reply Br. 4, App. Br. 6); (2) whether the Examiner erred in articulating a reason with rational underpinning that would have led a person of ordinary skill in the art to modify the split torque transmission of White to have double helical gears as taught by Kish in the manner claimed (App. Br. 8), and (3) whether the Examiner erred in finding that White describes a first and a second spur gear periphery, and face gear periphery as called for in claims 41 and 45 (App. Br. 9).

## FINDINGS OF FACT

We find that the following enumerated findings are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d

---

<sup>4</sup> The Grounds of rejection section of the Examiner's Answer noted claim 43 as being rejected under 35 U.S.C. § 103 (Ans. 10). However, the Final Rejection mailed February 6, 2007 (FR 3), denoted claim 43 as being rejected under 35 U.S.C. § 102(b). In the Appeal Brief, Appellant argued claim 43 as being rejected under 35 U.S.C. § 102 (App. Br. 4). Claim 43 will be considered on appeal as being rejected under 35 U.S.C. § 102(b).

1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

*Appellant's Invention*

1. Appellant's Specification describes that:

The face gear 20, through a pinion shaft 26, drives a floating pinion 24. The pinion shaft 26 defines a pinion gear axis of rotation P which is displaceable off the face gear axis of rotation F (schematically illustrated in Figure 3). Preferably, the pinion shaft 26 provides a flexibility which defines a pinion gear displacement envelope  $D_E$  (Figure 3).

(Spec. 4: ¶ [26]) (emphasis added).

*The Examiner's Findings*

2. The Examiner finds that White describes a floating pinion gear 116 (col. 11, ll. 30-37) (Ans. 6, 12).
3. The Examiner further finds that White describes a radially unsupported pinion shaft that supports face gear 115 and floating pinion gear 116 (Ans. 12).
4. The Examiner still further finds that White's radially unsupported pinion shaft (the shaft supporting face gear 115 and floating pinion gear 116) has a resilient characteristic (Ans. 13).
5. The Examiner still further finds that White describes a first spur gear periphery 117 and a second spur gear periphery 117 arranged in an overlapping manner on a first side of the output gear 100, and a face gear periphery 115 arranged in an overlapping manner on a second side of the output gear 100 (Ans. 8-9).

*The Board's Findings*

6. White describes that:

In the lower half of FIG. 7, each of the two second stage reduction bevel gears 115 and attached pinions 116 is on a line joining the axes of the corresponding adjacent final drive pinions 108. When the axis of the drive pinion 116 is collinear with the axes of the two dual drive gears 117 . . . by allowing the drive pinion 116 to float freely between the two driven gears 117, its driving position set by the balance of two diametrically opposed mesh forces.

(col. 11, ll. 26-37).

7. White shows in figure 7 that the drive gears<sup>5</sup> (spur gears) 117 are arranged on top of the combining gear (output gear) 100.

8. White further describes “placing the second stage cross shaft bevel pinions 113 and 114 and reduction gears 115 underneath the combining gear 100 such that the top of the cross shaft bevel pinions 113 and 114 mesh with their mating reduction bevel gears.” (col. 11, ll. 18-22).

9. Appellant has not contested the Examiner’s findings as to teachings of Kish (Reply Br. 5, App. Br. 8).

10. The ordinary meaning of the word “resilient” includes “tending to recover from or adjust easily to . . . change.” MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY (10<sup>th</sup> ed. 1996).

---

<sup>5</sup> White refers to gear 117 as both a drive gear and a driven gear (col. 11, ll. 31 and 35) (*See also* Fact 6). Therefore, in this Decision on Appeal, gear 117 will be referred to as being both a drive gear and a driven gear.

11. The ordinary meaning of the word “flexible” includes “characterized by a ready capability to adapt to new, different, or changing requirements.” MERRIAM-WEBSTER’S COLLEGiate DICTIONARY (10<sup>th</sup> ed. 1996).
12. Additional findings as necessary appear in the Analysis portion of this opinion.

## PRINCIPLES OF LAW

### *Appellant’s Burden*

Appellant has the burden on appeal to the Board to demonstrate error in the Examiner’s position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) (“On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.”) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)). *See also Ex parte Yamaguchi*, 88 USPQ2d 1606, 1614 (BPAI 2008) [burden on appeal] (on appeal, applicant must show examiner erred); *Ex parte Fu*, 89 USPQ2d 1115, 1123 (BPAI 2008); *Ex parte Catan*, 83 USPQ2d 1569, 1577 (BPAI 2007); and *Ex parte Smith*, 83 USPQ2d 1509, 1519 (BPAI 2007).

### *Anticipation*

“Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention.” *RCA Corp. v. Applied Digital Data Sys., Inc.*, 730 F.2d 1440, 1444 (Fed. Cir. 1984). It is not necessary that the

reference teach what the subject application teaches, but only that the claim read on something disclosed in the reference, i.e., that all of the limitations in the claim be found in or fully met by the reference. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772 (Fed. Cir. 1983).

### *Obviousness*

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). See also *KSR*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”).

In *KSR*, the Supreme Court stated that:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

*KSR*, 550 U.S. at 418.

The Court noted that “[t]o facilitate review, this analysis should be made explicit.” *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”)). However, “the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418.

In *KSR*, the Supreme Court stated that:

Helpful insights, however, need not become rigid and mandatory formulas; and when it is so applied, the TSM test is incompatible with our precedents.

. . .

. . . There is no necessary inconsistency between the idea underlying the TSM test and the *Graham* analysis. But when a court transforms the general principle into a rigid rule that limits the obviousness inquiry, as the Court of Appeals did here, it errs.

*See KSR*, 550 U.S. at 419.

### *Claim Interpretation*

When construing claim terminology in the United States Patent and Trademark Office, claims are to be given their broadest reasonable interpretation consistent with the specification, reading claim language in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

## ANALYSIS

Appellant argues claims 1, 3, 4, 12, 16-24 and 38 as a group (App. Br. 4). As such, we select claim 1 as representative of the group, and claims 3, 4, 12, 16-24 and 38 will stand or fall with claim 1. Appellant argues claims 5-11, 13-15, 26, 27, 39 and 40 as a group (App. Br. 8). As such, we select claim 8 as representative of the group, and claims 5-7, 9-11, 13-15, 26, 27, 39 and 40 will stand or fall with claim 8. 37 C.F.R. § 41.37(c)(1)(vii) (2007). Appellant argues claim 41 and 45 separately (App. Br. 9).

### *Rejection of claims 1, 3, 4, 12, 16-24 and 38 under 35 U.S.C. § 102(b) as being anticipated by White*

Appellant contends that White does not describe a radially unsupported pinion shaft and a floating pinion gear mounted for rotation about a floating pinion axis of rotation, which provides a resilient characteristic as called for in claim 1 (Reply Br. 4, App. Br. 4, 6). Appellant further contends that when White describes that the pinion gear 116 can float freely between the two driven gears 117, White is describing that the pinion gear 116 may float vertically along its axis of rotation (Reply Br. 4).

The Examiner found that White describes a floating pinion gear 116 (Fact 2).

The Examiner further found that White describes a radially unsupported pinion shaft that supports face gear 115 and floating pinion gear 116 (Fact 3).

Since White describes that the pinion gear 116 is allowed to float freely between two drive gears 117 (Fact 6), we see no error in the Examiner's finding that pinion gear 116 is a floating pinion gear (Fact 2).

White further describes that the driving position of the floating pinion gear 116 is set by the balance of the two diametrically opposed mesh forces of driven gears 117 (Fact 6).

We find that as the pinion gear 116 moves between the opposed mesh forces of the driven gears 117 to its driving position there will be some movement of the pinion gear 116 in the radial direction. Since there is some movement of the White's pinion gear 116 in the radial direction, we see no error in the Examiner's finding that White's pinion gear 116 has a radially unsupported pinion shaft (Fact 3).

The Examiner further found that White's radially unsupported pinion shaft (the shaft supporting face gear 115 and floating pinion gear 116) has a resilient characteristic (Fact 4).

Appellant's Specification describes that the pinion shaft 26 provides a flexibility which defines a pinion gear displacement envelope  $D_E$  (Fact 1). Claim 1, lines 4-6 call for "said floating pinion gear mounted for rotation about a floating pinion axis of rotation which provides a resilient characteristic" (App. Br. 11). Therefore, claim 1 recites the word resilient in place of the word flexible used in Appellant's Specification.

The ordinary meaning of the word "resilient" includes "tending to recover from or adjust easily to change" (Fact 10) and the ordinary meaning of the word "flexible" includes "characterized by a ready capability to adapt to new, different, or changing requirements" (Fact 11).

A person having ordinary skill in the art reading claim 1, in light of the Specification and in accordance with its ordinary meaning of the words “resilient” and “flexible,” would understand that the limitation “said floating pinion gear mounted for rotation about a floating pinion axis of rotation which provides a resilient characteristic” as called for in claim 1, lines 4-6 (App. Br. 11) means that the floating pinion gear is able to adapt to the position that it floats to. *See In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d at 1364.

Since White describes that the driving position of the floating pinion gear 116 is set by the balance of the two diametrically opposed mesh forces of driven gears 117 (Fact 6), we find that the floating pinion gear is able to adapt to the position that it floats to and, therefore, has a resilient characteristic. Therefore, we see no error in the Examiner’s finding that White’s radially unsupported pinion has a resilient characteristic (Fact 4).

Accordingly, we find that White describes a radially unsupported pinion shaft and a floating pinion gear mounted for rotation about a floating pinion axis of rotation, which provides a resilient characteristic as called for in claim 1.

We conclude that Appellant has not demonstrated that the Examiner erred in rejecting claim 1 over White. Appellant has likewise not demonstrated error in the Examiner’s rejection of claims 3, 4, 12, 16-24 and 38, which fall with claim 1.

*Rejection of claims 5-11, 13-15, 26, 27, 39 and 40 under 35 U.S.C. § 103(a) as being unpatentable over White in view of Kish*

Appellant contends that there is no teaching, suggestion or motivation in White or Kish themselves for making the proposed combination (App. Br. 8). To the extent that Appellant is arguing for a rigid application of the teaching-suggestion-motivation test, this argument is not persuasive in light of the Court’s decision in KSR, 550 U.S. at 419 (holding that it is error to apply the teaching-suggestion-motivation test as a rigid formula to limit the obviousness inquiry).

Appellant further contends that Kish does not cure the deficiencies in White (Reply Br. 5, App. Br. 8).

Appellant has not contested the Examiner’s findings as to teachings of Kish (Fact 12).

We find that Appellant has provided no further arguments regarding claim 8 than those presented for claim 1.

Therefore, we find that Appellant’s contentions regarding the rejection of claim 8 as being unpatentable over White in view of Kish are not persuasive for the reasons set forth above in our discussion of the rejection of claims 1 as being anticipated by White.

Accordingly, we conclude that Appellant has not demonstrated that the Examiner erred in rejecting claim 8 over White in view of Kish. Appellant has likewise not demonstrated error in the Examiner’s rejection of claims 5-7, 9-11, 13-15, 26, 27, 39 and 40, which fall with claim 8.

*Rejection of claims 41-44 under 35 U.S.C. § 102(b) as being anticipated by White; and claim 45 under 35 U.S.C. § 103(a) as being unpatentable over White in view of Kish*

Appellant contends that White does not describe a first and a second spur gear periphery overlapping an output gear on a first side of the output gear, and a face gear periphery overlapping the output gear on a second side of the output gear as called for in claims 41 and 45 (App. Br. 9).

The Examiner found that White describes a first spur gear periphery 117 and a second spur gear periphery 117 arranged in an overlapping manner on a first side of the output gear 100, and a face gear periphery 115 arranged in an overlapping manner on a second side of the output gear 100 (Fact 5).

White shows in figure 7 that the drive gears (spur gear) 117 are arranged on top of the combining gear (output gear) 100 (Fact 7). White describes that the second stage cross shaft bevel pinions 113 and 114 and reduction gears (face gear) 115 can be placed underneath the combining gear 100 such that the top of the cross shaft bevel pinions 113 and 114 mesh with their mating reduction bevel gears (Fact 8). In this modified arrangement of figures 7 and 8 of White, the drive gear peripheries (spur gears) 117 are located on top (a first side) of the combining gear (output gear) 100, and the reduction gear periphery (face gear) 115 is located underneath (a second side) the combining gear (output gear) 100. Thus, we see no error in the Examiner's finding regarding the overlapping spur gear and face gear arrangement (Fact 5).

Therefore, we find that White describes the overlapping spur gear and face gear arrangement as called for in claims 41 and 45.

Accordingly, we conclude that Appellant has not demonstrated that the Examiner erred in rejecting claims 41 and 45. Appellant has likewise not demonstrated error in the Examiner's rejection of claims 42-44, which depend from claim 41.

#### CONCLUSIONS OF LAW

Appellant has not established that the Examiner erred in finding that White describes a radially unsupported pinion shaft and a floating pinion gear mounted for rotation about a floating pinion axis of rotation which provides a resilient characteristic as called for in claims 1, 8 and 12.

Appellant has not established that the Examiner erred in articulating a reason with rational underpinning that would have led a person of ordinary skill in the art to modify the split torque transmission of White to have double helical gears as taught by Kish in the manner claimed.

Appellant has not established that the Examiner erred in finding that White describes a first and a second spur gear periphery, and face gear periphery as called for in claims 41 and 45.

#### DECISION

The decision of the Examiner to reject claims 1, 3-24, 26, 27 and 38-45 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

Klh

CARLSON, GASKEY, & OLDS, P.C./SIKORSKY  
400 WEST MAPLE ROAD, SUITE 350  
BIRMINGHAM, MI 48009